

Linewidth Analyzer

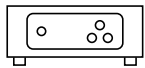
LWA-1k 1550



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Wavelength Range	min.	typ.	max.
1530 – 1625 nm	1530 nm	1550 nm	1625 nm
Input power range (@typical wavelength)			
0.5 – 8 mW	0.5 mW	5 mW	8 mW
Required Input Power Stability			
± 5 %			
Laser type			
Laser type CW, single mode			
Input fiber type			
PM-FC/APC			
Maximum frequency stroke (@ f > 10Hz)			
30 MHz			



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Frequency Noise Specification

		10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	> 1 MHz
Noise floor $N_{\Delta\nu}$ @ typ. input power and wavelength ⁷⁾	Hz/ $\sqrt{\text{Hz}}$	80	40	15	10	8	5
Laser phase noise floor @ typ. input power and wavelength ^{3) 8)}	rad/ $\sqrt{\text{Hz}}$	8	400m	15 m	1 m	80 μ	5 μ
	dBrad/ $\sqrt{\text{Hz}}$	18	-8	-36	-60	-82	-106
Equivalent interferometer signal noise @ typ. input power and wavelength ^{3) 5)}	rad/ $\sqrt{\text{Hz/m}}$	2.5 μ	1.3 μ	460 n	310 n	250 n	160 n
	dBrad/ $\sqrt{\text{Hz/m}}$	-112	-118	-126	-130	-132	-136
Frequency noise bandwidth ⁴⁾		10 Hz – 10 MHz					
Minimum measurable intrinsic linewidth (lorentzian linewidth @ 1 μ s)		< 350 Hz					
Effective linewidth range (optical linewidth @ 100 ms) [β -separation method]		< 1 k – 20 M					
Relative intensity noise limit (lorentzian linewidth)		On request only					
Dynamic range		60 dB					

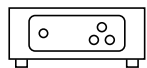
3) Not included in the software, can be calculated by the user from exported data.

4) According to a -3 dB criterion.

5) This is the calculated noise of the interferometer phase of a two path interferometer with length imbalance L (in meters). The calculation is performed for a given frequency noise density floor by $2\pi nL/c \times N_{\Delta\nu}$ with n being the refractive index of the reference fiber interferometer material and c being the speed of light in vacuum. Values in the table are given for a refractive index of n=1.46 and a reference length of 1 meter.

7) $N_{\Delta\nu}$ is the noise floor of the instrument in terms of the square root of the power spectral density of the frequency noise.

8) The phase noise floor corresponds to the noise floor of the square root of the power spectral density of the phase. It is calculated from $N_{\Delta\nu}$ by the formula $1/f \times N_{\Delta\nu}$. Additionally, phase noise is often specified in terms of L(f) which can be calculated with the formula $L(f) = 1/f^2 \times N_{\Delta\nu}^2/2$.



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Lineshape Specifications

Effective linewidth range (FWHM)	< 1 kHz – 10 MHz
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Dynamic range	60 dB
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Miscellaneous

Interface	USB 2.0 Type B
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Analog Output / error signal	BNC ± 7.5 (50 Ω) ± 15 (high impedance) V, single ended
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Cutoff (highpass filter)	10 Hz, 1 kHz, 10 kHz, 100 kHz
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Dimensions	220 mm \times 334 mm \times 96 mm
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Weight	8 kg
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Digitizer Module

Sample rate	62.5 (max.) MSa/s
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Resolution	16 bits
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Acquisition time	1 – 100 ms
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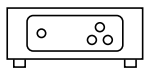
Evaluation time ⁶⁾	10 m – 1 (typ.) s
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Communication	USB 3.0 Type B
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Dimensions	210 mm \times 200 mm \times 74 mm
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Weight	2 kg
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6) Windows 10 or newer, Intel i5 8600 / AMD Ryzen 5 2600 or better, 16GB RAM or more.



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Further Information

For further technical information, application examples, diagrams
and for customisation of linewidth analyzers please contact:

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